ACCELERATOR DIVISION ADMINISTRATIVE PROCEDURE

ADAP-11-0002

ES&H REVIEW OF EXPERIMENTS, TESTS, AND R&D PROJECTS

RESPONSIBLE DEPARTMENT: ADHQ

PREPARED BY _____ **DATE** 3 Jan 11
ES&H Department Head

APPROVED BY _____ **DATE** 1-11-11
Accelerator Division Head

REVISION NO. 1 **REVISION ISSUE DATE** 1/3/2011

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1.0 PURPOSE AND SCOPE

Experiments in the Accelerator Division (AD) require ES&H review to help ensure that all appropriate standards and requirements are met. Test and/or R&D efforts may require ES&H reviews and Operational Readiness Clearance (ORC) prior to start-up if they meet any of the items under the "Guidelines for Establishing a Safety Review" section. These ES&H reviews, because of specificity or complexity, are outside of the normal purview of the established Laboratory Safety Committee (LSC) Subcommittees. Consequently, ES&H Review Committees for experiments, tests, and R&D projects have been established. This document defines the procedures for these committees. Operation of experiments depends on satisfactory reviews and is controlled for specific parts of an apparatus by partial Operational Readiness Clearance (pORC). Final operational authority is granted by an Operational Readiness Clearance (ORC).

The Accelerator Division Head and the Division, Section, or Center (D/S/C) Head responsible for the experimental area are both required to sign the Operational Readiness Clearance form before an experiment is allowed to receive beam. This is a positive means to ensure that both D/S/Cs are aware of operating conditions and parameters for each experiment and have agreed that the appropriate procedures, safety equipment, and run conditions are in place and functional before the start of the experiment.

2.0 RESPONSIBILITIES

The **Accelerator Division Head** or designee, develops the charge to the committee; establishes the level of review needed; and names committee members in consultation with D/S/C Heads, Department Heads, LSC Subcommittee Chairs, and AD SSO as appropriate.

The **ES&H Review Committee** is normally charged to complete a timely and accurate safety review and provide a written report describing its conclusions to one or more of the following: the Division Head, the Project Engineer, the Chairperson of the appropriate LSC subcommittee, and the experiment spokesperson.

The **ES&H Review Coordinators** are assigned by the AD Head to work with individual experiments. To accomplish their assignments, the ES&H Review Coordinators are expected to work with the AD SSO, the experiment spokesperson, the Project Engineer, and the liaison physicist as appropriate. Their primary responsibility is to assist and guide the experimenters to the completion of the Operational Readiness Clearance (ORC). This includes working with the experimenters to determine the elements of the experiment that require special review, and to set-up the appropriate review committees to accomplish this review. Coordinators for active AD Review Committees are listed on the AD ESH Department website at the following link: http://ad-esh.fnal.gov/ad/review_committees.pdf.

3.0 ES&H REVIEW CRITERIA FOR EXPERIMENTS, TESTS AND R&D PROJECTS

1. All experiments, tests, or projects having complex or hazardous systems or operations shall be subjected to a safety analysis and review by an ES&H Review Committee.
   a. The analysis and review will look at all aspects of the system which could present a hazard to personnel or equipment.
   b. The analysis shall demonstrate that the system is designed and constructed in accordance with applicable codes and standards.
   c. The relevant analysis and review shall be completed before initial operation of any part of the system.
2. The committee will be available for the life of the experiment to review new additions to the experiment. All new proposals, including significant modifications to existing equipment, must be reviewed and approved for operation through the ORC process.
3. Experiments that have been previously approved but have been idle for greater than 30 days must contact the ES&H Review Coordinator to determine whether another review is needed. The experiment will verify, in writing, the end date of the previous run and that the experiment/test/project has not changed. The ES&H Review Coordinator will then inform all ORC signatories of the approval to run or any recommendations determined necessary to resume the experiment. In any case, a renewal ORC will be generated.

4.0 GUIDELINES FOR ESTABLISHING A SAFETY REVIEW

The following items require an ES&H review. This is not a complete list. Reviews shall be required whenever the Division Head, Project Engineer, system designer, ESH Review Coordinator, SSO, or other knowledgeable person so determines. **Note**: All systems must meet all Fermilab safety standards.

Computers or Programmable Logic Controller (PLC) Use: Detector or apparatus control systems that rely solely on dedicated computers or PLC's for safety, environment, or property protection functions must comply with Director's Policy #21.

Cryogenic Hazards: Cryogenic systems for magnets, hydrogen targets, calorimeters, or any cryogenic system with inventory exceeding 200 liters.

Electrical Hazards: Electrical systems which meet any of the following criteria:

- Uses non-commercial or modified commercial equipment.
- Uses non-PREP or modified PREP equipment.
- Any non-commercial low voltage high current or high voltage distribution systems.
- Any equipment with large capacitor banks.

Environmental Hazards: All proposed activities which will utilize any chemicals (hazardous or otherwise) and the proposed installation/utilization of any equipment or process that would result in a release to the environment shall include an environmental review. An environmental review, to address any potential air quality issues associated with a proposed activity, shall be

conducted early in the activity planning process. This shall be done in order to ensure that preconstruction permits are secured prior to commencement of any permit required activities.

Fire Hazards: Any large combustible items such as large quantities of plastic scintillator, large numbers of cables requiring cable trays.

Flammable Gas Systems: Any use of flammable gas and flammable gas mixtures.

Homemade or Modified Tools or Equipment: A review may be required for homemade or modified tools and equipment. A tool is defined as any instrument of manual operation and equipment is defined as an instrumentality needed for an undertaking or to perform a service.

Laser Hazards: Lasers of class III B or higher.

Mechanical Hazards: Devices which meet any of the following criteria:

- Weighs over 3 tons and is supported above the floor
- Exceeds 10 tons in total weight
- Moves at a speed greater than 5 ft/sec
- Costs more than $100,000 to replace
- Includes pressure/vacuum vessels

Oxygen Deficiency Hazards: Use of any oxygen displacing gases such as chamber gas systems, helium bag systems, dry nitrogen, cryogenic magnets, or targets.

Pressure and Vacuum Vessels and Systems: All pressure and vacuum vessels as defined in the Fermilab ES&H Manual require an engineering review.

Radiation Hazards: Radioactive sources/materials which will be used. Specify if embedded in detectors.

Toxic Materials: Toxic/hazardous materials used in any quantity. Examples include: lithium, beryllium, mercury, lead, uranium, cyanide, PCB's, freons, some oils.

5.0 OPERATIONAL APPROVALS

Prior to operating equipment or performing work on experimental apparatus in AD spaces, the assigned ES&H Review Committee will review and inspect the equipment. All partial Operational Readiness Clearance forms must be completed and approved by the Review Committee Coordinator, the AD Senior Safety Officer, and finally, the AD Head. Other signatures may be required depending on the scope and location of the work. Examples of additional signatures are the AD Radiation Safety Officer (RSO), other Division/Section Heads when work is being performed in their areas or affecting their workers, and other D/S Senior Safety Officers when work is being performed in their areas or affecting their workers.

The experiment spokesperson is required to assure the AD Head in writing that the hazards in the experiment have been identified to all its participants and that all participants have received

appropriate training and instruction. This is required before the ORC will be signed. An example ORC approval form is included in Attachment A. The form may be modified as necessary to include the requided approvals.

6.0 DISTRIBUTION

An electronic controlled copy of this procedure is maintained on the ESH Department website at: http://ad-esh.fnal.gov/ad_adap.html.

Appendix A – Operational Readiness Clearance

Experiment or Test: _____

Reviewed and Approved By:	**Date**
_____ Accelerator Division Head	_____
_____ Accelerator Physics Center Head	_____
_____ Landlord Department Head	_____
_____ Accelerator Division SSO	_____
_____ Accelerator Division RSO	_____
_____ Accelerator Division Operations Department Head	_____
_____ ES&H Coordinator	_____

Submitted By:	**Date**
_____ Requester	_____

Electronic approvals for this form are acceptable. Please forward your responses to all recipients. The original signed document will be maintained in the Accelerator Division Office. A copy of the document will be forwarded to the experiment requesting approval to operate.